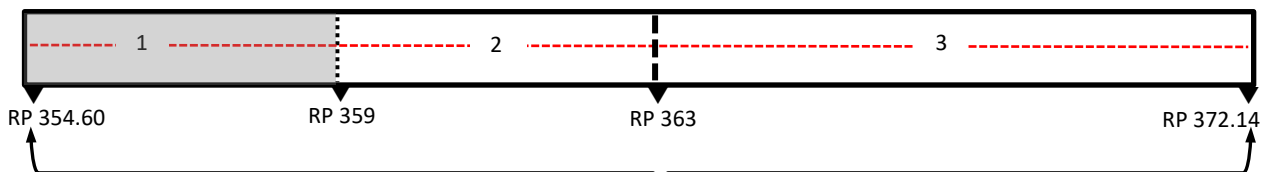


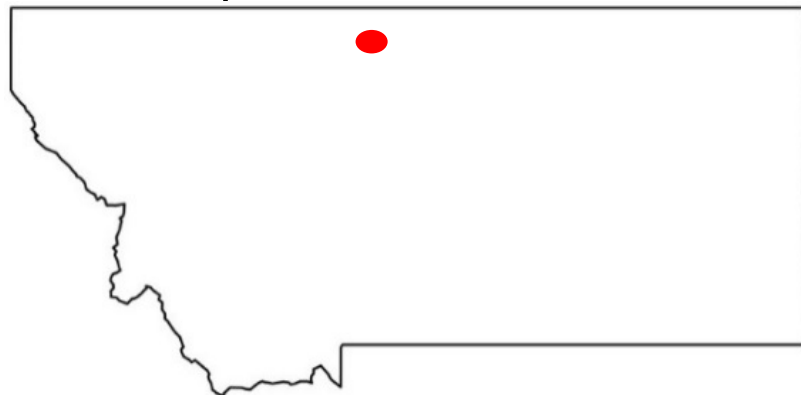
**Experimental Feature Evaluation
December 2022**

Experimental Feature:	Chip Seal Comparison: CRS-2p and CHFRS-2p
Location:	Great Falls District, Hill County, US Hwy 2, RP 354.60 – RP 372.14
MDT Project Name:	Gildford – East
MDT Project Number:	NH 1-6(123)355[9393]
Experimental Project Number:	MT-20-02
Principle Investigator:	Chad DeAustin, Experimental Project Manager (ExPM)
Technical Contact:	MDT Surfacing
Construction Date:	Paved August 2019, Chip Seal June 2020
Date of Inspections:	September 2021, June 2022

Project Map



- *All values approximate
- 1 – CRS-2p w/ CSS 1H Fog Seal
 - 2 – CRS-2p no Fog Seal
 - 3 – CHFRS-2p no Fog Seal



Feature Description & Outline

The feature was designed to evaluate three different chip seal (CS) applications. The differing applications were placed adjacent to compare efficacy in chip retention and overall CS performance.

The MDT chip seal project was on US Highway 2 in a rural area between Havre and Shelby with an average annual daily traffic (AADT) for all vehicles of approximately 1471. The project was from approximate reference point 354.60 to 372.14 for a total of 17.54 miles. The project included a full width overlay at a depth of .22' of new plant mix surfacing in 2019. The project received the chip seal in summer 2020.

The experimental feature was separated into three distinct sections.

Section 1: RP 354.60 to RP 359 received the CRS-2P (Cationic Rapid Set) chip emulsion and CSS-1H (Cationic Slow Set) as the fog application.

Section 2: RP 359 to 363 received only the CRS-2P chip emulsion.

Section 3: RP 363 to RP 372.14 received the CHFRS-2P (Cationic High-Float Rapid Set) chip emulsion with no added fog seal.

All emulsions used on the project were supplied by Western Emulsions and MDT Type 1 Chips were used.

Evaluation Procedures & Schedule

The measure of effectiveness prevalent with this feature are:

- Construction practice,
- Effectiveness in chip retention of CRS-2p and CHFRS-2p,
- Effect of snowplow activity on chips at centerline.

In accordance with MDT's Experimental Features Procedures, the Experimental Project Manager will monitor and report on performance for a minimum of five years annually. This includes delivery of a work plan, construction report, annual reports, and final project report.

2020: Installation/Construction Report
2021-2024: Annual Inspections/Evaluation Reports
2025: Final Evaluation/Final Report

A dedicated [webpage](#) provides all reporting for the experimental feature.

2022 Inspection - June

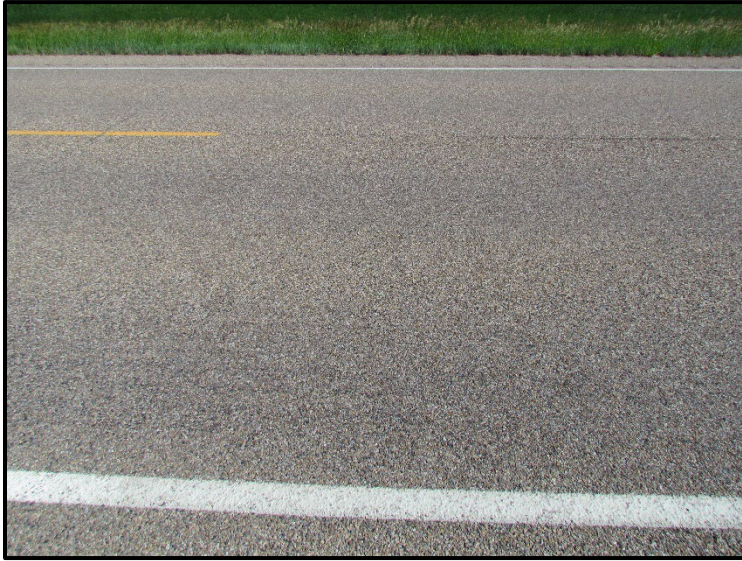
Section 1 with CRS-2p and a CSS-1H fog seal, showed no change in condition from 2021 and normal wear was noticed. The CSS-1H was still noticeable. Section 2 also showed little change from 2021 with a small section of centerline chip loss near RP 361. Section 3 had the most chip loss. It was seen mostly between RP 367 and RP 368 only at the centerline. The driving lanes of all three sections showed no mentionable change or discernable differences.



← Transverse surface view near RP 354.6. West end of the project, CRS-2p emulsion with CSS-1h fog seal. Normal wear was noticed.



← Close-up views of the chip seal surface and texture.



← Transverse view near RP 359. CRS-2p emulsion without fog seal section. This section experienced some chip loss at the centerline. See next page for examples.



←↓ Close-ups of the chip seal surface and texture.





↑ View of centerline chip loss near RP 361.



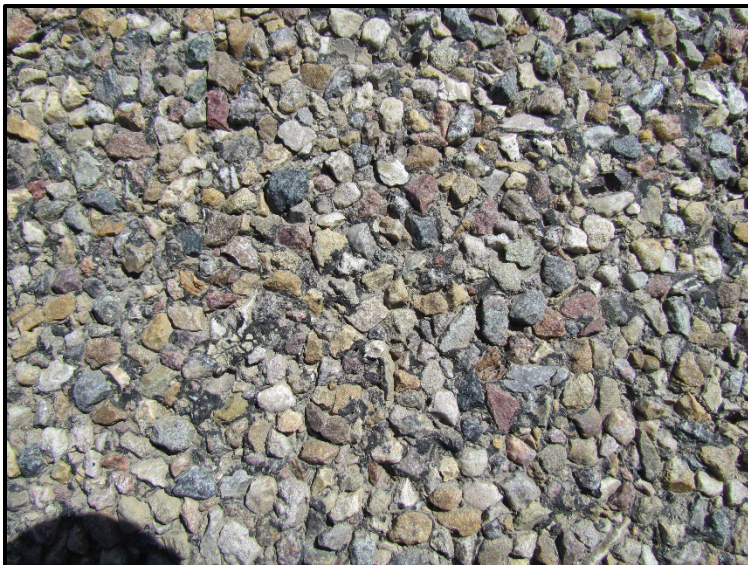
↑ Close-up of centerline chip loss.

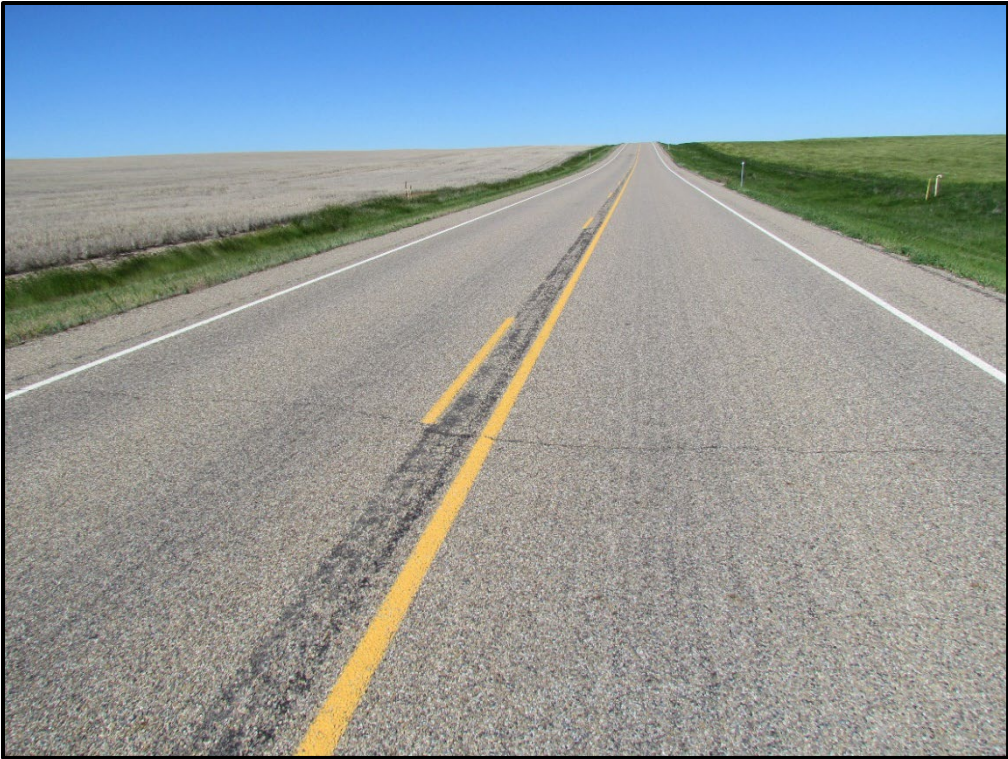


← Transverse view near RP 359. CHFRS-2p emulsion without fog seal section. This section also experienced some chip loss at the centerline. See next page for examples.



←↓ Close-ups of the chip seal surface and texture.





↑ View of centerline chip loss near RP 367. This loss occurred mostly between RP 367-368 and covered almost the entire mile.



↑ Close-up of centerline chip loss.

Construction – July/August 2019 Paving



↙↘ Representative images of paving using ½ inch Grade S PMS with PG 64-28 binder.

Project did not receive chip seal until summer of 2020.



May/June 2020 Chip Seal



↙↘ Representative images of project CRS-2P emulsion application, chipping phase with type 1 chips, and pneumatic nine-wheel compaction.





← Completion of CHFRS-2p section after sweeping. View is at east end of project at RF 372, view west.



←↓ Several images of embedded chip texture.





← Completion CRS-2p without fog seal section after sweeping. View is at RP 363, view west.



←↓ Several images of embedded chip texture.





← Begin of CSS-1H fog application on CRS-2p section at RF 359 view west.



←↓ Several images of fog seal and chip texture.





↑ End of CSS-1H fog seal over CRS-2p project section; west end, view west at approximate RP 355.

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